WHAT IS CLAIMED IS:

1. A polynucleotide that encodes a polypeptide that reduces the amount of glucose side chain of a polysaccharide antigen specific to *Streptococcus mutans*,

wherein the polynucleotide comprises:

a base sequence of any of SEQ ID NO: 1 through 4; or

a base sequence with the deletion, substitution, or addition of one or more bases in the base sequence of any of SEQ ID NO: 1 through 4.

2. A polynucleotide that encodes a polypeptide that reduces the amount of glucose side chain of a polysaccharide antigen specific to *Streptococcus mutans*,

wherein the polynucleotide comprises:

a polynucleotide of a base sequence of any of SEQ ID NO: 1 through 4; or

a polynucleotide that hybridizes under stringent conditions with a polynucleotide having a complementary base sequence to the polynucleotide of the base sequence of any of SEQ ID NO: 1 through 4.

3. An oligonucleotide that comprises a base sequence, or a complementary sequence thereof, with at least 12 contiguous bases of a base sequence of any of SEQ ID NO:

1 through 4.

4. An oligonucleotide of claim 3, which comprises a base sequence of any of SEQ ID NO: 8 through 10.

5. A polypeptide that is encoded by a polynucleotide of claim 1 or 2.

6. A *Streptococcus mutans* strain with a reduced amount of glucose side chain in a polysaccharide antigen specific to *Streptococcus mutans*.

7. A *Streptococcus mutans* strain of claim 6, which comprises a polynucleotide of claim 1 or 2.

8. A *Streptococcus mutans* strain of claim 6, which expresses a polypeptide of claim 5.

9. An antibody that specifically binds to a *Streptococcus mutans* strain of *any of* claims 6 through 8.

10. A method for detecting a *Streptococcus mutans* strain in a subject sample, comprising the steps of:

separating bacteria from the subject sample;

extracting genomic DNA or total RNA of the bacteria

separated from the subject sample; and

carrying out a PCR reaction, using the genomic DNA or total RNA as a template, and using an oligonucleotide of claim 3 or 4 as a primer.

11. A method for detecting a *Streptococcus mutans* strain in a subject sample set forth in claim 10, wherein the tissue sample is obtained from blood, saliva, or plaque.

12. A method for detecting a *Streptococcus mutans* strain in a subject sample set forth in claim 10 or 11, wherein the primers are an oligonucleotide of a base sequence of SEQ ID NO: 8, and an oligonucleotide of a base sequence of SEQ ID NO: 9 or 10.

13. A method for detecting a *Streptococcus mutans* strain in a subject sample, comprising the steps of:

separating bacteria from the subject sample;

extracting genomic DNA or total RNA of the bacteria separated from the subject sample; and

carrying out a hybridization reaction for the genomic DNA or total RNA, using an oligonucleotide of claim 3 or 4 as a probe.

14. A method for detecting a *Streptococcus mutans* strain in a subject sample set forth in claim 13, wherein the tissue sample is obtained from blood, saliva, or plaque.

15. A method for detecting a *Streptococcus mutans* strain in a subject sample set forth in claim 13 or 14, wherein the oligonucleotide has a base sequence of any of SEQ ID NO: 8 through 10.

16. A method for detecting a *Streptococcus mutans* strain in a subject sample set forth in *any of* claims 10 through 15, wherein the step of separating bacteria uses an antibody of claim 9.

17. A method for detecting a *Streptococcus mutans* strain in a subject sample, comprising the steps of:

separating bacteria from the subject sample;

incubating the separated bacteria with an antibody of claim 9; and

detecting bacteria that have bound to the antibody.

18. A method for determining a serotype of a *Streptococcus mutans* strain in a subject sample, the method comprising using a method of *any of* claims 10

through 17.

19. A screening method of a *Streptococcus mutans* strain, the method comprising using a method of any one claims 10 through 17.

20. A *Streptococcus mutans* strain, which is obtained by a screening method of claim 19.

21. A kit for detecting a *Streptococcus mutans* strain, the kit comprising an oligonucleotide of claim 3 or 4.

22. A kit for detecting a *Streptococcus mutans* strain set forth in claim 21, wherein the oligonucleotide comprises a base sequence of SEQ ID NO: 9.

23. A kit for detecting a *Streptococcus mutans* strain set forth in claim 22, the kit further comprising an oligonucleotide of a base sequence of SEQ ID NO: 8.

24. A kit for detecting a *Streptococcus mutans* strain set forth in claim 23, the kit further comprising an oligonucleotide of a base sequence of SEQ ID NO: 10.

25. A kit for detecting a *Streptococcus mutans* strain

set forth in *any of* claims 21 through 24, which is used for a PCR reaction or a hybridization reaction.

26. A kit for detecting a *Streptococcus mutans* strain, the kit comprising an antibody of claim 9.

27. A method for producing an antibody of claim 9, comprising the step of injecting a *Streptococcus mutans* strain of *any of* claims 6 through 8, suspended in a buffer, intravenously into the auricular vein of rabbits repeatedly for 5 consecutive days.

28. A method for producing an antibody set forth in claim 27, further comprising the step of repeating immunization of the *Streptococcus mutans* strain, suspended in a phosphate-buffered saline, one week after the injecting step and for another 2 weeks, 5 times each week.

29. A bacteria detecting tool, which comprises an oligonucleotide, fixed on a substrate, that include a base sequence with at least 12 contiguous bases of a base sequence of any of SEQ ID NO: 1 through 4.

30. A bacteria detecting tool of claim 29, wherein the

oligonucleotide comprises an oligonucleotide of claim 3 or 4.